Amendments to the Claims:

1.   (Currently amended) A circuit, comprising:

a direct conversion receiver coupled to receive a radio frequency signal and produce an analog signal;

an analog to digital converter coupled to receive the analog signal and produce baseband digital input signals having real and imaginary components; and

a digital baseband circuit, comprising:

first and second input ports for receiving the digital input signals; and

a controller coupled to the first and second input ports for estimating the gain and phase imbalance of the digital input signals, wherein the controller estimates the gain mismatch as:

$$\hat{\gamma} = \frac{g_I}{g_Q} = \frac{\alpha_I - \beta_Q}{\alpha_I + \beta_Q}, \text{ where } g_I, g_Q \text{ are the gains of the real and imaginary components of the digital}$$

input signals, α_I is a pilot symbol despread by a normal spreading sequence and β_Q is the pilot symbol despread by a IQ-swapped spreading sequence.

2.   (Cancelled)

3.   (Original) A digital baseband circuit as defined in claim 1, wherein the controller comprises a digital signal processor.

4.   (Currently amended) A digital baseband circuit as defined in claim 2 1, wherein the controller estimates the phase mismatch as:

$$\hat{\theta} = 2\tan^{-1}\frac{\alpha_Q - \beta_I}{\alpha_I - \beta_Q} = -2\tan^{-1}\frac{\alpha_Q + \beta_I}{\alpha_I + \beta_Q},$$

wherein α_I and α_Q are pilot symbols despread by a normal spreading sequence and β_I and β_Q are pilot symbols despread by an I/Q-swapped spreading sequence.

5.   (Currently amended) A digital baseband circuit as defined in claim 2 1, further comprising:

a gain and phase correction circuit coupled to the first and second input ports.

6.   (Original) A digital baseband circuit as defined in claim 5, wherein the gain and phase correction circuit includes first and second multipliers coupled to the first input port and third and fourth multipliers coupled to the second input port.

7.   (Original) A digital baseband circuit as defined in claim 6, wherein the gain and phase correction circuit further comprises a look-up-table coupled to the first, second, third and fourth multipliers.

8.   (Original) A digital baseband circuit as defined in claim 7, wherein the look-up-table comprises a read-only memory (ROM).

9.   (Original) A digital baseband circuit as defined in claim 5, wherein the controller estimates the phase mismatch as:

$$\hat{\theta} = 2\tan^{-1}\frac{\alpha_Q - \beta_I}{\alpha_I - \beta_Q} = -2\tan^{-1}\frac{\alpha_Q + \beta_I}{\alpha_I + \beta_Q},$$

wherein α_I and α_Q are pilot symbols despread by a normal spreading sequence and β_I and β_Q are pilot symbols despread by an I/Q-swapped spreading sequence; and

the gain and phase correction circuit uses phase and gain estimates to provide a gain and phase correction to the digital input signals.

10.   (Original) A digital baseband circuit as defined in claim 9, wherein the gain and phase correction circuit applies correction to the digital input signals using the formula:

$$X(\gamma,\theta) = \frac{1/g_Q}{\cos(\theta/2) + \sin(\theta/2)} \begin{bmatrix} \dfrac{\cos(\theta/2)}{\gamma} & \sin(\theta/2) \\ \dfrac{\sin(\theta/2)}{\gamma} & \cos(\theta/2) \end{bmatrix}.$$

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11.   (Currently amended) A method for estimating and correcting ~~the~~ a gain and phase imbalance of digital signals in a direct sequence code division multiple access ~~(DS-CDMA)~~ system, comprising the steps of:

estimating the gain imbalance as follows:

$$\hat{\gamma} = \frac{g_I}{g_Q} = \frac{\alpha_I - \beta_Q}{\alpha_I + \beta_Q}$$, where g_I, g_Q are the gains of ~~the real and imaginary components~~ a real

component and an imaginary component of the digital input signals, α_I is a pilot symbol despread by a normal spreading sequence and β_Q is the pilot symbol despread by a ~~an~~ I/Q-swapped

spreading sequence; and

estimating the phase imbalance as follows:

$$\hat{\theta} = 2\tan^{-1}\frac{\alpha_Q - \beta_I}{\alpha_I - \beta_Q} = -2\tan^{-1}\frac{\alpha_Q + \beta_I}{\alpha_I + \beta_Q}$$, where α_I and α_Q are pilot symbols despread by a normal

spreading sequence and β_I and β_Q are pilot symbols despread by an I/Q-swapped spreading sequence.

12.   (Original) A method as defined in claim 11, further comprising the step of:
using the gain and phase imbalance estimates to correct for the gain and phase imbalance in the digital signals, using the formula:

$$X(\gamma,\theta) = \frac{1/g_Q}{\cos(\theta/2) + \sin(\theta/2)} \cdot \begin{bmatrix} \dfrac{\cos(\theta/2)}{\gamma} & \sin(\theta/2) \\ \dfrac{\sin(\theta/2)}{\gamma} & \cos(\theta/2) \end{bmatrix}.$$

13.   (Currently amended) A method as defined in claim 12, wherein the correction of the gain and phase imbalance is performed by a gain and phase correction circuit having a plurality of multipliers, and a look-up-table providing the plurality of multipliers gain and phase offset correction information based on gain and phase imbalance information.

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14.   (Currently amended) A method of estimating ~~the~~ an amplitude mismatch ~~(gain imbalance) in a (CDMA)~~ in a receiver, comprising the steps of:

(a) determining ~~the~~ a real component of ~~the~~ a pilot signal despread by a regular sequence ~~regular despread pilot signal~~;

(b) determining ~~the~~ an imaginary component of the pilot signal despread by an I/Q-swapped ~~pilot sigal~~ spreading sequence; and

(c) finding ~~the~~ a difference between the real component of the ~~regular despread~~ pilot signal despread by the regular seequence and the imaginary component of the pilot signal despread by the I/Q-swapped ~~pilot sigal~~ spreading sequence.

15.   (Original) A method as defined in claim 14, wherein steps (a) and (b) are performed by a correlator.

16.   (Original) A method as defined in claim 15, wherein step (c) is performed by a digital signal processor.

17.   (Currently amended) A method of estimating ~~the~~ a phase mismatch ~~(phase imbalance) in a (CDMA)~~ in a receiver, comprising the steps of:

(a) determining ~~the~~ an imaginary component of a ~~regular despread~~ pilot signal despread by a regular sequence;

(b) determining ~~the~~ a real component of ~~the I/Q swapped pilot sigal~~ the pilot signal despread by an I/Q swapped spreading sequence; and

(c) finding the difference between the imaginary component of the ~~regular despread~~ pilot signal despread by the regular sequence and the real component of the ~~I/Q swapped pilot sigal~~ pilot signal despread by the I/Q swapped spreading sequence.

18.   (Original) A method as defined in claim 17, wherein steps (a) and (b) are performed by a correlator.

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19.   (Original) A method as defined in claim 18, wherein step (c) is performed by a digital signal processor.

20.   (Cancelled)

21.   (Cancelled)

22.   (Cancelled)

23.   (Cancelled)